Having described the invention, the following is claimed:

1. A method of detecting at least one signal of interest within an input signal, comprising:

multiplying at least one set of samples from the input signal by at least one set of samples representing a complex conjugate of the input signal to obtain a series of correlation samples;

summing sets of one or more consecutive correlation samples to obtain a series of pulse sums; and

integrating a plurality of non-consecutive pulse sums to obtain a search value.

2. A method as set forth in claim 1, further comprising the step of comparing the search value to a predetermined threshold value.

3. A method as set forth in claim 1, wherein each pulse sum has an associated start time, and associated start times of each pair of non-consecutive pulse sums are separated by a pulse repeat interval associated with the search value.

4. A method as set forth in claim 3, wherein the search value has an associated start delay, based upon the start time associated with a first of the plurality of pulse sums

5. A method as set forth in claim 4, wherein the step of summing a plurality of non-consecutive pulse sums is repeated for a series of associated start delays and pulse repeat intervals to obtain plurality of search values, each with an associated start delay and pulse repeat interval

6. A method as set forth in claim 5, further comprising the steps of comparing each search value to a threshold value and accepting the associated values for the start delay and pulse repeat interval as signal characteristics where the search value exceeds the threshold.

7. A method as set forth in claim 1, wherein the set of input signal samples are derived from the input signal as it is received at a first location, and the set of complex conjugate samples is derived from the input signal as it is received at a second location.

8. A method as set forth in claim 7, wherein the signal is associated with a signal source, having an associated direction in relation to the first location, and the associated direction is determined from a phase value associated with the input signal.

9. A cross-correlation detection system comprising:

a digital multiplier that multiplies at least one set of samples from the input signal by at least one set of samples representing a complex conjugate of the input signal to obtain a series of correlation samples;

at least one digital integrator that sums sets of one or more consecutive correlation samples to obtain a series of pulse sums; and

a digital signal processor that integrates a plurality of non-consecutive pulse sums to obtain a search value.

10. A system as set forth in claim 9, wherein the digital signal processor compares the search value to a predetermined threshold value.

11. A system as set forth in claim 9, wherein the system is implemented as part of an interferometer that determines the direction of a detected signal from the system.

12. A system as set forth in claim 9, wherein the digital signal processor obtains a plurality of search values, each having an associated pulse repeat interval according to a time delay between the non-consecutive pulse sums.

13. A computer program product, operative in a data processing system, that detects at least one signal of interest within an input signal, comprising:

a digital multiplication function that multiplies at least one set of samples from the input signal by at least one set of samples representing a complex conjugate of the input signal to obtain a series of correlation samples;

at least one integration function that sums sets of one or more consecutive correlation samples to obtain a series of pulse sums; and

a search function that integrates a plurality of non-consecutive pulse sums to obtain a search value.

14. A computer program product as set forth in claim 13, wherein the search function compares the search value to a predetermined threshold value.

15. A computer program product as set forth in claim 13, wherein each pulse sum has an associated start time and the search value has an associated start delay, based upon the start time associated with a first of the plurality of pulse sums.

16. A computer program product as set forth in claim 15, wherein the associated start times of each pair of non-consecutive pulse sums are separated by a pulse repeat interval associated with the search value.

17. A computer program product as set forth in claim 16, wherein the search function repeatedly sums a plurality of non-consecutive pulse sum for a series of associated start delays and pulse repeat intervals to produce a plurality of search values, each with an associated start delay and pulse repeat interval.

18. A computer program product as set forth in claim 17, wherein the search function compares each search value to a threshold value and accepts the associated values for the start delay and pulse repeat interval as signal characteristics where the search value exceeds the threshold.

19. A computer program product as set forth in claim 13, wherein the set of input signal samples are derived from the input signal as it is received at a first antenna, and the set of complex conjugate samples is derived from the input signal as it is received at a second antenna.

20. A computer program product as set forth in claim 19, wherein the signal is associated with a signal source, having an associated direction in relation to the first antenna, and the associated direction is determined from a phase value associated with the input signal.